CLAIMS

1. Method of producing a complex structure by assembling two substrates (5, 6; 11, 13) at respective connecting faces thereof, the structure being adapted to be dissociated in a separation region, characterized in that, prior to assembly, a tangential stress state difference is created between the two faces to be assembled by curving each of the two substrates to be assembled by applying mechanical forces, this difference being selected to obtain a predetermined stress state within the assembled structure at the moment of dissociation.

2. Method according to claim 1 of producing a complex structure, characterized in that the tangential stress state difference between the two faces to be assembled is selected to minimize the stresses in the separation region at the moment of dissociation.

3. Method according to claim 1 or claim 2 of producing a complex structure, characterized in that the two substrates are curved so that the two faces to be assembled are respectively concave and convex.

4. Method according to claim 3 of producing a complex structure, characterized in that the two substrates are curved so that the two faces to be assembled are complementary.

5. Method according to claim 4 of producing a complex structure, characterized in that the two substrates are curved so that the two faces to be assembled are respectively spherical concave and spherical convex.

6. Method according to any one of claims 1 to 5 of producing a complex structure, characterized in that the mechanical forces applied to the substrate result from the creation of a pressure difference between the two faces of said substrate.

7. Method according to claim 6 of producing a complex structure, characterized in that the pressure

difference between the two faces of the substrate to be curved so that it has a concave face to be assembled is created by aspirating said substrate onto a concave preform having a suitable profile selected as a function of that to be imparted to the face to be assembled and on which the substrate structure rests locally at its periphery.

8. Method according to claim 6 of producing a complex structure, characterized in that the pressure difference between the two faces of the substrate to be curved so that it has a concave face to be assembled is created by aspirating said substrate into a cavity, the substrate resting locally at its periphery on a seal bordering the cavity.

9. Method according to any one of claims 1 to 5 of producing a complex structure, characterized in that the mechanical forces applied to the substrate are the result of deforming the substrate between complementary first and second preforms, one of which is concave and the other of which is convex, with profiles selected as a function of that to be imparted to the face to be assembled.

10. Method according to claim 9 of producing a complex structure, characterized in that the first preform is one of the substrates to be assembled that has already been curved to the selected profile.

11. Method according to claim 9 or claim 10 of producing a complex structure, characterized in that the second preform has aspiration channels for keeping the substrate curved when the first preform has been removed.

12. Method according to any one of claims 1 to 5 of producing a complex structure, characterized in that the mechanical forces are applied simultaneously to the two substrates to be assembled by deforming the two substrates between two preforms having profiles selected as a function of those to be imparted to the faces to be assembled.

13. Method according to any one of claims 1 to 12

of producing a complex structure, characterized in that mechanical forces are applied to at least one of the substrates by means of a preform consisting of a mold.

14. Method according to claim 13 of producing a complex structure, characterized in that said preform consists of a porous mold.

15. Method according to any one of claims 1 to 12 of producing a complex structure, characterized in that mechanical forces are applied to the substrates with the aid of at least one deformable preform.

16. Method according to any one of claims 1 to 15 of producing a complex structure, characterized in that the two substrates are assembled by molecular bonding.

17. Method according to any one of claims 1 to 15 of producing a complex structure, characterized in that the two faces to be assembled are treated to facilitate bonding.

18. Method according to any one of claims 1 to 17 of producing a complex structure, characterized in that the substrates are assembled by direct contact, the surface of at least one of these substrates being adapted to prevent trapping of air between the assembled surfaces.

19. Method according to claim 18 of producing a complex structure, characterized in that at least one of the substrates is pierced.

20. Method according to claim 19 of producing a complex structure, characterized in that said substrate is pierced at its center.

21. Method according to claim 18 of producing a complex structure, characterized in that at least one of the substrates includes at least one dead-end channel discharging at the edge of the substrate.

22. Method according to any one of claims 1 to 15 of producing a complex structure, characterized in that the substrates are assembled by means of a flow layer.

23. Method according to any one of claims 1 to 22 of producing a complex structure, characterized in that assembly is carried out at a temperature higher than room temperature.

24. Method according to claim 23 of producing a complex structure, characterized in that the substrates are heated by contact with heated preforms.

25. Method according to claim 24 of producing a complex structure, characterized in that the preforms are heated to respective different temperatures.

26. Method for transferring a thin layer from a source substrate to a target substrate, comprising the following steps:

- ionically implanting the source substrate through one face thereof to create a buried weakened layer at a particular depth relative to the implanted face of the source substrate, a thin layer thereby being delimited between the implanted face and the buried layer,

- assembling one face of the source substrate to one face of the target substrate to form an assembled structure,

- dissociating the thin layer from the remainder of the source substrate in the buried layer,

characterized in that, prior to assembly, a tangential stress state difference is created between the two faces to be assembled by curving each of the two substrates to be assembled by applying mechanical forces, this difference being selected to obtain within the assembled structure a predetermined stress state at the moment of dissociation.

27. Method according to claim 26 of transferring a thin layer, characterized in that the tangential stress state difference between the two faces to be assembled is selected to minimize the internal stresses at the moment of dissociation.